Name: _____   Period: _____

"CONVERSIONS E"

Directions: Complete each problem. You may use your Conversions Sheet. Be sure to show all work as shown in class. Partial credit may be earned for work shown. For some problems accuracy may be noted in terms of how far you go past the decimal place)

TEMPERATURE   1. You just arrived in Houston, the temperature reads <u>39° Celcius</u>. What is the temperature in <u>Fahrenheit</u>? (Be sure to identify the equation to be used in your answer, show all necessary steps for credit)

$°F = 9/5 (°C) + 32$

LEVEL 1 $°F = 9/5 (39) + 32$

$°F = 70.2 + 32$

$°F = $ <u>102.2 °F</u>

DENSITY   2. The formula for density = mass (in grams) / volume (cm^3). An object has a mass of <u>5.0 kilograms</u> and a volume of <u>7,250 cm^3</u>.

LEVEL 1   A.   What is the <u>mass of the object in grams</u>?

5.0 Kg x 1000 g/Kg = 5000 grams

LEVEL 2   B.   What is the <u>density of the object</u>? (Record answer out <u>2 decimal places</u>)

$D = M/V$ 5000 grams/7250 cm^3 ➔ 0.69 g/cm^3

LEVEL 2

C. Will the object <u>float or sink</u>? (Explain your answer)

It will float, since it's less than 1.0.

AREA   3. A desk is <u>90 cm</u> wide by <u>40 cm</u> long. What is the surface area of the desk? (Record in cm^2)

90 cm x 40 cm = 3600 cm^2

LEVEL 1

WEIGHT   4. An object has a <u>weight of 1150 N</u> on <u>Earth</u>. What is the <u>Weight of the object on the Moon</u>? (Remember, that gravity on the moon is 1/6 that of Earth) (Record answer out 1 decimal place)

1150 N (ON EARTH) x 1/6 = 191.7 N

LEVEL 1

VOLUME

5. You have a beaker of water, a rock, and 100 mL of water. You place the 100 mL of water in the beaker. You then place the rock in the water. The water level goes from 100 mL to 155 mL.

LEVEL 1

A. What is the volume of the water displaced by the rock in mL?

155-100 = 55 mL

B. What is the volume of the rock in cm^3?

LEVEL 1
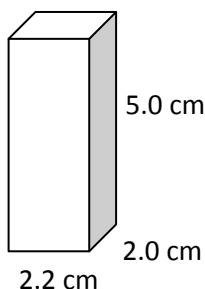
55 mL = 55 cm^3

DENSITY

6. An object is 60 grams and it's measurements are shown below.

LEVEL 1

A. What is the mass of the object?

60 grams

5.0 cm

LEVEL 1

B. What is the volume of the object? (Go out one decimal place)

2.0 cm

2.2 cm

2.0 cm x 2.2 cm x 5.0 cm ➔ 22.0 cm^3

LEVEL 2

C. What is the density of the object? (Record Answer 1 Decimal Place)

D = M/V ➔ 60 g/22.0 cm^3 ➔ 2.7 g/cm^3

AREA

7. A classroom measures 25 feet long and 20 feet wide.

LEVEL 1

A. Floor tiles measure 1 ft^2. How many floor tiles are needed to redo the floor?

25 ft x 20 ft = 500 ft^2 Therefore, you need 500 tiles.

B. The floor tiles you like come 20 in a box, how many boxes must you buy? *NOTE: you can't buy a partial box, and must tile the entire floor.*

LEVEL 2

500/20 = 25 ➔ 25 boxes

C. How many m^2 is the floor? (Record your answer out 1 decimal place)

500 ft^2 x 0.09 m^2/ft^2 =45.0 m^2

LEVEL 1

A-MASS   8. An object is <u>3555 lbs</u>, what is its <u>mass in Kilograms</u>? (<u>Record your answer out 1 decimal place</u>)

LEVEL 1

3555 lbs x 0.45Kg/lb = 1599.8 Kg

TEMPERATURE 9. The temperature in your hot tub reads 101.5 ° Fahrenheit. What is the temperature in Celcius? (Be sure to identify the equation to be used in your answer, show all necessary steps for credit) (<u>Record your answer out 1 decimal place</u>)

LEVEL 1

°C = 5/9 (°F-32)
°C = 5/9 (101.5-32)
°C = 5/9(69.5)
°C = <u>38.6 ° C</u>

VOLUME   10. Using the diagram provided, determine the <u>volume in cubic feet</u> of the aquarium? (Record your answer out 1 decimal place)

3.5 ft x 1.8 ft x 2.0 ft = 12.6 ft^3
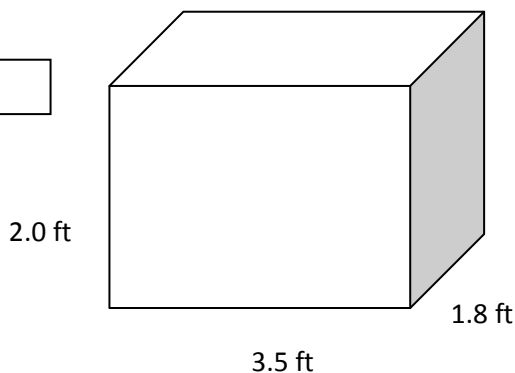
LEVEL 1

2.0 ft

1.8 ft

3.5 ft

VOLUME   11. Using the answer from the question above, <u>how many gallons</u> could the aquarium hold? (HINT: there are 0.13368 ft^3 in 1 gallon) (<u>Record your answer out 1 decimal place</u>)

LEVEL 2

12.6 ft^3 x 1 gal /0.13368 ft^3 = 94.3 Gallons

LENGTH   12. A mile is 5,280 feet. *Remember: 10 mm = 1 cm, 100 cm = 1 m, 1 km = 1000 m*
                A.   How many meters is are in <u>2.5 miles</u>? (Use 0.30 meters = 1 foot)

LEVEL 1

2.5 miles x 5280 ft/mile x 0.30 m/ft = 3960 meters

                B.   How many centimeters is that? (use previous answer to do this problem)

LEVEL 2

3960 meters * 100 cm/1 m = 396,000 cm

C. How many millimeters is that? (use previous answer to do this problem)

396,000 cm * 10 mm/1 cm = 3,960,000 mm

MASS   13. The cost of gold is $1,369.65 per ounce (as of 10/15/10). Your grandmother left you 60 grams of gold coins and you want to purchase your first car. The car you want is $3100.

A. How many ounces do you own? (Gold is expensive, go out as many decimal places as you can, you don't want to be ripped off during the exchange)

60 grams * 0.035 oz/gram = 2.1 ounces

B. If you sell the gold, how much money can you get? (Go to the nearest cent)
2.1 ounces * $1,369.65/ounce = $2876.27

C. Do you have enough to buy the car? If not, how much are you short. If you have extra, how much extra. Be sure to include how much extra money you will have, or how much money you are short.

Not enough, you need $223.73 more.

WEIGHT   14. An object is 5555 Kg on Earth. (Weight = Mass x Acceleration) Remember, that Mass must be in Kg, and Acceleration of Gravity on Earth is 9.8 m/s^2. (Round to the nearest whole number)

A. What is the Weight of the object on Earth?

W = M * A   W = 5555 Kg * 9.8 m/s^2 → 54,439 Kg*m/s^2 → 54,439 N

B. What is the Weight of the object on Jupiter? (To calculate Weight on another planet, you must first find the Weight in Newtons on Earth, then multiply by the other planets relative gravity) (Record Answer out 1 decimal place)

54,439 N * Relative Gravity Jupiter (2.54) → 138,275.1 N

TEMPERATURE   15. Scientists are conducting and experiment. The temperature they must conduct the experiment at is 17.5 Kelvin. What is that temperature in degrees Celcius? (Be sure to identify the equation to be used

in your answer, show all necessary steps for credit, record answer out 1 decimal place)
°C = K – 273
°C = 17.5 – 273
°C = -255.5 °C

LENGTH   16. You run a 200 meter dash. How many feet did you run? (Round to the nearest whole number)

200 m x 3.28 ft/m = 656 ft

LEVEL 1

MASS   17. An object has a mass of 1500 Kg on Earth. What is the mass of the object on the moon?

LEVEL 2

1,500 Kg, mass never changes.

DENSITY   18. The density of fresh water is 1.0 g/cm3. Anything < 1.0 will float. Anything > 1.0 will sink. If you build a boat and it has a mass of 5,250 Kg and a volume of 10,000,000 cm^3.

A. What is the mass in grams? (Remember, there are 1000 grams in 1 kilogram)

LEVEL 1

5,250 Kg x 1000 grams/1 Kg = 5,250,000 grams

B. What is the Density? (Go out two decimal places)

LEVEL 2

$D = M/V$ ➔ 5,250,000 grams/10,000,000 cm^3 ➔ 0.53 g/cm^3

C. Will it sink or float? (Explain Your Answer)

LEVEL 2

Float, since less than 1.0

TEMPERATURE   19. Scientists are conducting and experiment. The temperature they must conduct the experiment at is 150 Kelvin. What is that temperature in degrees Fahrenheit? (Be sure to identify the equation to be used in your answer, show all necessary steps for credit)

LEVEL 3

°C = K – 273
°C = 150 – 273
°C = -123 °C

°F = 9/5 (°C) + 32
°F = 9/5 (-123) + 32
°F = -221.4 + 32
°F = -189.4 °F